THE APPLICATION OF STANDARD COSTS TO FACTORY OVERHEAD EXPENSES

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SOME CONTROVERSIAL PHASES OF STANDARD COSTS

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The Use of the Term Standard Costs

ONE of the most impressive features of the literature on standard costs lies in its bewilderment for the reader. At the outset one is faced with the difficulty of an attempt to define the term standard costs because of the fact that there are nearly as many conceptions of standard costs as there are proponents of the idea. In a great many cases there is but a remote connection between the various conceptions. To many accountants and others the term standard cost conveys the idea of uniformity. This has been carried over into a consideration of standards in industry, such as a standardization of the product in order to effect mass production through scientific management, and standardization of materials and rates of wages. At the outset these conceptions will be eliminated as having no connection with the subject in question. It might appear that this statement is trite but there is a substantial volume of literature under the head of standard costs devoted entirely to what might better be termed standardization or rationalization.

In this study the term standard cost will be used to designate a predetermined cost of each operation in such a way that these predetermined costs become an integral part of the accounting system—the system to be so arranged that variations from standard costs will be currently and expeditiously collected and classified and provision made for their accurate analysis both from the standpoint of use or efficiency and price. These standard operation costs may be used to determine the standard cost of the completed article. Many accountants are fairly well agreed up to this point. As to the matter of how these costs are to be calculated and handled there is a wide diversity of opinion. The question of whether a standard should represent an ideal situation, or an average of past cost, or what should be expected in the future is one around which there are many opinions. There

are two factors responsible in a large way for these differences of opinion. The first is that industry is represented by so many diversified lines and conditions and sets of problems it is only natural that it should lead to different interpretations. The second factor is that extensive application of standard costs to industry is not more than ten or twelve years old. It is to be expected that with the adoption of any new principle of theory there must be a period of experimentation before it comes into general uniform usage.

It is the purpose of this study to examine some phases of the application of standard costs with the view of comparing some differing features as applied and the results obtained from their application.

The Importance of Accurate Costs

The entire literature of cost accounting is permeated with the importance to industry of getting accurate and dependable costs. It is desirable that the accounting profession should work toward uniformity in the underlying principles of cost determination. While it is to be granted that the needs of different industries will require different application of these principles, nevertheless, as pointed out by Mr. Nelson Gaskill in his address before the last convention of the National Association of Cost Accountants, in New York, it remains that a substantial degree of uniformity in methods is necessary if the accounting profession hopes to convince the general public of the reliability of cost information. There are many who are unsatisfied with the generally accepted methods of cost accounting in that they are not producing sufficiently accurate costs. There is always with us the practical problem that management wants its cost information with the least outlay. It is not to be doubted that corners are cut in many cases to save expense of compiling more reliable costs with a considerable sacrifice of accuracy in the results obtained. Hence, there are many different kinds of cost systems. In general, where standard costs are not used, overhead expense for example, is distributed along one of the conventional lines; viz., Labor Cost, Productive Hours, Machine Hours, etc. One important difference stands out between these methods and the conception of

standard costs. That difference relates to the basic idea as to what the cost to manufacture really is. In all the literature of cost accounting prior to 1918 the writer has been unable to find any method other than that in which the entire costs of manufacture must in some way or another be loaded on to the product being manufactured. The result is, of course, that the unit cost of a product fluctuates from time to time. This fluctuation in cost is due to two general sets of factors. On the one hand the cost of material, labor, or overhead may fluctuate in price or use; on the other hand variations in the capacity of output of a plant reflect variations in cost because, while some of the components of cost fluctuate up or down with production, there are a substantial number of overhead expense items which do not. These are the fixed items such as rent, taxes, insurance, depreciation and to some extent the cost of that large group of service departments such as engineering, purchasing, planning, production, cost accounting departments and others.

The underlying principle in general cost accounting is that these overhead costs, fluctuate though they may, constitute a manufacturing cost and should be spread over the products manufactured in some equitable manner.

Before the advent of standard costs there was no procedure incorporated in the accounting system to measure satisfactorily the efficiency of the plant or its production centers other than that of comparing actual costs of one period or job lot with the actual costs of another. It is not to be doubted that statistical measures of one kind or another are used outside the formal accounting system as a check on efficiency at different points. It is vigorously argued by some that predetermined costs have been known and used for at least fifty years. This is true in scattered cases and is confined to a few industries. The difference between these predetermined costs and standard costs is that the earlier predetermined costs were merely estimates and, with some few exceptions were not made a part of the accounting system. Further, there appears to have been no effort to analyze the variations by causes. Analysis of variances was not the purpose of these predetermined costs. Finally, the point of view seems to have been that estimates were to be compared with actual figures to see how far the estimates failed to meet the actual costs. The

more modern point of view is quite the reverse. The standard costs are assumed to represent what the costs should be. The interest lies in the extent to which the actual costs vary from the standard costs, and in the analysis of the variances in order to determine the cause. This, of course, implies very carefully set standards in every detail.

Standard Costs versus Actual Costs

In consideration of the relative accuracy of standard costs to actual costs, one should say that it is not maintained that standard costs will yield accurate results of product costs. Nor is it admitted that any system of cost accounting will yield accurate actual costs. In fact, no accounting statement purports to reveal actual circumstances. All accounting statements should be statements of opinion of qualified experts after careful consideration of all of the facts available. A balance sheet and a profit and loss statement are statements of opinion of the valuation of a business enterprise for a definite purpose and an opinion of the profits earned for an accounting period. If six professional accountants were asked each to prepare a balance sheet and profit and loss statement from the same ledger and with the same data the statements would probably all differ in some respects. To be sure, if they were prepared by competent accountants they would probably not vary much but there would be differences of net income. In narrowing our field of interest to cost statements it is unfortunate that the term actual cost is used in connection with the results obtained from job cost and process cost systems. The actual cost of a product or process is impossible of exact ascertainment under present industrial conditions. Actual costs are often accepted as fact, as if they represented a definitely determinable amount. The term actual often conveys the wrong implication. Many overlook the point that in determining this so-called actual cost, arbitrary divisions of overhead have been made and arbitrary divisions of joint costs and by-product costs have been used. No method has ever been devised to measure the actual cost of the product of a modern industrial plant. This statement is not made as an apology for standard costs. It is not intended to convey the impression that if costs cannot be accu-

rately determined one might as well use standard costs which are only a little more inaccurate than so-called actual costs. The writer's opinion is that if the standards have been carefully set it is more than likely they will be more nearly accurate than job costs.

In the case of job costs, let us first consider the item of material. Material for the manufacture of a product lies in the store house. It has been purchased at different times and at different prices. A certain amount of it is drawn out and put on the manufacturing line. In many cases it is impossible to tell just which lot is being drawn from because it is not practicable to keep the lots separate. The result is that an average cost is used. In some job lots there may be more waste than in others. In those lots in which there is greater waste the actual cost of the lot is said to be greater than others. If the lots are small the variation from waste will be more apt to be greater. If the lots are large the variation will likely be less. The point is, that the size of the lot is an arbitrary division point. It is a matter of manufacturing convenience and has no basis in logic so far as the manufacturing costs are concerned.

Take the case of labor under a job cost method—the amount of time spent on each piece will vary. A worker may spend less time on a piece in the morning when he is not fatigued. Labor may be lost due to an interruption in the orderly scheduling of work. Workers of different capacities for production are employed on the same lot. There are many other causes for variation. The total labor for the lot is summed up and divided by the number of pieces turned out to get an average labor cost per piece. The result is not an actual cost per piece as the figure might seem to indicate, but an average cost. This average cost is again affected by the size of the lot, which, as was indicated, is an arbitrary division.

In the case of overhead under a job cost plan, the amount of overhead for an accounting period is estimated and applied to the product at an estimated rate which is in many cases only a guess. The under or over over-absorbed burden is then closed into profit and loss. All along the line the so-called actual cost is made up of a series of averages and estimates. The question then arises, in what way does the standard cost plan overcome

any of these inaccuracies? If standard costs are carried on the books of account how are they apt to be a closer approach to the actual circumstances than the so-called actual costs? In the case of material a carefully worked out material usage standard is arrived at by taking into consideration the loss from waste that would normally be expected in the conditions under which the laborer works. A price standard is arrived at after careful consideration of what the price has been in the past, together with any information available as to what trend the price might be expected to take in the future. Labor standards are worked out for time based upon time studies and motion studies. The labor performance must follow the routine as prescribed by the engineering department. A labor price standard is arrived at in the same general way as the material price standard. With reference to factory overhead, this again must be an estimate—but, with the detail and care with which standards are prepared the likelihood is that the overhead rate will be more systematically prepared than under a job cost method—more depends upon it.

Under a standard cost system, if the standards are based upon what is expected from normal operations under efficient conditions, and, if these standard costs are carried into the accounts, the cost for the product will always be the same. It is an average cost but there have been eliminated the fluctuations due to the fact that one lot happened to be small or that there was a temporary interruption which increased the cost of this lot and when the next lot came along there was no interruption in the flow hence the costs were lower. Other causes will result in slight variations in cost such as the fact that a lot happened to be put through the plant during abnormally warm weather which slowed up the workers. There are many things which cause costs to temporarily become larger or smaller. There is no reason for saying that each piece of one lot costs more than each piece of a subsequent lot because something of this nature has happened. The size of the lot is an arbitrary division point. To be sure, it is impracticable to attempt to calculate the actual cost of each piece individually even if it were possible. The cost of setting up automatic machinery is often substantial. It costs no more to set up machinery for a large lot than it does for a small lot, nevertheless under a job cost system the cost of the set-up ex-

pense for a small lot is greater per piece than the set-up cost for a large lot.

Standard costs provide costs which would approximate actual costs if the size of the lots were infinite and all of these temporary irregularities ironed out.[1] One of the methods of eliminating errors in a series of data is to increase the size of the sample. Standard costs do this very thing. Costs of production should reflect the average cost under normal conditions. Temporary fluctuations into subnormal and abnormal costs should not disturb the cost of production. There is, however, a substantial difference of opinion as to what this normal cost should be and how it should be calculated. Its meaning will be discussed presently. It might be maintained that standards do not reflect trends. This is not correct, because the variance accounts perform that function. Variations from standard are put into the variance accounts set up for that purpose.

Divergent Conceptions of the Purpose of Standard Costs

A substantial portion of the difference in the application of standard cost principles appears to be due to varying conceptions of their purpose. Mr. G. Charter Harrison says in discussing the subject, "The primary purpose of standard costs is to furnish information to the management which will enable the profits of the business to be increased and considered from the standpoint of profit making, which is the only proper standpoint from which to consider any business instrument, whether it is a sales policy, a producing machine, or a cost system. Standard costs represent a great advance over the old-time retrospective or job-order cost system. . . . A cost system can add to the profits of a business in three ways: 1. In disclosing the existence of preventable inefficiencies, or unnecessary leaks of profits in the factory; 2. In furnishing information as to costs of manufacture which will enable the sales departemnt to obtain that combination of sales volume and sales price which will result in the greatest net profit under the prevailing conditions; 3. In reducing to a minimum the clerical work in connection with cost accounting, whether in

[1] For a further discussion of this point see Thomas Downie, Mechanism of Standard Cost Accounting, Gee & Company, London, 1927, pp. 109-114.

the factory or in the office." [2] The third reason given is not essential to this discussion.

Some appear to see in standard costs only the first purpose as essential—that of disclosing the existence of preventable inefficiencies. Others look upon standard costs as having a dual primary purpose. In addition to providing a means of cost control, they look upon standard costs as costs. Some authorities deny that standard costs are costs. They say that they are merely a measuring device from a definite point.

In those cases in which standards are looked upon as a goal to attain under most favorable operating conditions, or as a standard of excellence, or as based upon maximum capacity, one could scarcely consider these standards as costs. They are goals toward which the efforts of management are aimed. In this case there would always be a debit variance in the performance variance accounts to take up the amount by which the performance fell short of these goals, whether it be material, labor or burden. Such standards would be dangerous to use as costs because the debit variances may be overlooked when the relationship between cost and selling price is considered. There is too great a danger that these losses will not be recovered in the selling price. A further objection would be that such standards could not be used as a basis for a bonus system without defeating the purpose of the bonus system.

There are other cases in which standards are considered as costs and the standards are based upon the results of past experience. Certainly, if standard costs have a primary purpose of disclosing inefficiencies which exist, standards which are based upon past experience defeat the purpose of standard costs and bury the inefficiencies of the past in these standards. Such standards will only show up the more serious errors which might develop in the future.

Most systems of standard costs are based on that which their authors call normal cost. The term is somewhat unfortunate because of its lack of descriptiveness. It comes in somewhat the

[2] Harrison, G. Charter, Standard Costs, The Ronald Press, New York, N. Y., 1930, p. 19.
For a fuller discussion of the second point given see Fundamentals of Standard Costs by the same author, Proceedings International Congress on Accounting, New York, 1929, Putnam's Sons, p. 867.

same category as the term which the bankers have been using recently to describe the value of the securities—intrinsic value. Normal is usually found to mean those costs or standards which a well operated plant ought reasonably to attain. For instance, in the case of material the standard should be set after taking into consideration past experience, of course, but modified by a very careful appraisal of what a reasonable usage figure should be. In the setting of a labor standard it may be necessary to make time and motion studies and perhaps test runs in order to find out what can reasonably be expected in the way of labor performance. In the setting of overhead standards the same care should be exercised, giving attention to the integration of the various departments in their respective capacities.[3] It is only necessary to say that the term normal usually appears to imply that performance which should be expected in a well organized and operated plant. Past experience may be used as a guide but it should be used after carefully eliminating avoidable wastes and losses.

Let us assume that it may be agreed that the most serviceable standards should be based upon those costs which should be expected in a well organized and operated plant in which avoidable losses have been eliminated. With this assumption as a starting point two divergent paths are followed. Should the standards remain fixed or should they be changed from time to time in order to conform to changes in operating conditions or changes in price levels? This question should be answered by again raising the question, What are the purposes of standard costs? If the answer is that standard costs have the single purpose of disclosing the existence of preventable inefficiencies, fixed standards could serve. If on the other hand the answer to the question is that standard costs have a dual purpose, that is, in addition, they should be regarded as costs, fixed standards could not be used. Price changes of recent years have been so violent that price variations under present conditions would be enormous and would reduce fixed standards to absurdity. It is the writer's opinion that stand-

[3] It is not practical to go into further detail here. These points were well covered in the session on Standard Costs in the 1930 Yearbook. See also Chapter XIII, Determining Normal Capacity, in Basic Standard Costs, by Eric A. Camman. American Institute Publishing Company, New York, 1932. pp. 202-214.

ard costs should perform this dual purpose. His views on standards as costs have been presented.

The objection has been raised that it is incorrect to set up production costs at what they should cost instead of what they did cost, because the former is a matter of opinion and the latter is fact. It is denied that production costs based upon actual costs represent facts, and that standard costs are any more matters of opinion than actual costs if the standards have been properly set. The reasons for supporting this point of view have been discussed under the topic, "Standard Cost versus Actual Costs."

The point has been made that if standard figures are used exclusively in finished goods and cost of goods sold, it is not possible to determine the actual cost of goods sold by products without maintaining variance accounts by lines of product, entailing additional labor. This is true; but, if standard costs are to be accepted as costs, why should it be necessary to determine the actual cost of goods sold by products? If standards are accepted as costs there is no point to determining the actual cost of goods sold.

Objection has been made to the practice of charging off variances on material and labor into costs of goods sold during the month in which the variances occurred. Inasmuch as the variation in production and sales is not uniform, the situation may develop in which the losses charged to production may be great at a time when the sales are low, throwing a disproportionate loss against profits. In answer to this criticism, it may be said that if standards are to be accepted as costs, and if this theory is carried to its logical conclusion, variances are not profit and loss items at all but should be carried as reserves.

Finally the criticism has been made that if the standards are revised from time to time to meet changes in methods of production or to reflect changes in price level, the use of the variances to determine trends over a period of time is largely lost. This criticism is well founded. In answer, however, the question arises, are there not more important advantages to be derived through the use of current cost standards than that which is lost in this connection? For example, is it not of greater value to know the relationship between current actual costs and what current costs should be, than it is to know the difference between current costs and what they should have been in the past? It seems to me that this is one

of the substantial advantages to be derived from the use of standard costs, namely, that the attention is focussed upon the present and not upon past history. There are, of course, difficulties to be faced in connection with the problem of revising standards and one of them is that of the difficulty in applying new standard prices to goods in process.[4]

Managerial Aspects of Standard Costs

Standards should be changed only when methods of manufacture change or when there appears to be a more or less permanent change in the price of those things purchased. For the purpose of control of factory efficiency price variations are not significant. They are segregated and the attention of the factory executives are directed to use variances.

Too many times the efficiency of a manufacturing plant is measured by the net profits for the period. While it is true that the net profits for the period do show final results, it is desirable to distinguish between those profits which are the result of good management and those which are the result of fortuitous economic circumstances. Standard costs, through the analysis of variances, materially assist in making this distinction.

In this connection it may be said that there is a further practical advantage in using standard costs in the accounts. This lies in the fact that the cost to manufacture the product is freed from seasonal or temporary cost fluctuations, which, if used, might prove detrimental as a basis for quoting prices. In the use of job costs, where all of the overhead expense is allocated to the product, there are times when production is abnormal and the costs per unit of a product are low. If the selling price is reduced it will be impossible to maintain the price when production falls off again. This may lead to an embarrassing situation. There are lines of business in which the market is restricted and replacement of the product is made at infrequent intervals. It may easily be possible to saturate the market with the product at the low prices, then, when production falls off there may be no business available. In-

[4] The foregoing answers to criticisms of current standards were suggested by the criticism of current standards in Basic Standard Costs by Eric A. Camman, American Institute Publishing Company, New York, N. Y., 1932, pp. 37-40.

stead of a surplus having been accumulated during the high production period to tide the business over, it has been passed on to the consumer. When production falls off, the production cost per unit being high, the concern may find that it cannot compete profitably in a market in which others may have stabilized production costs through the use of standards. The question is by no means wholly a theoretical one.

The Calculation of an Idle Time or Volume Variance

It is generally agreed that the most valuable advantage of the use of standard costs lies in the ability to discover inefficiencies in manufacturing enterprises and to point out their sources. This being the case the development of variances and their interpretation assumes a most significant rôle. Curiously enough there are many systems of standard costs in operation which stop short of a careful analysis of variations from standards. Instances have been found by the writer in which the variances are merely thrown together in one account and closed into cost of goods sold or profit and loss without any attempt at analysis. A great deal of valuable information can be learned through a careful analysis of the variances.

There are wide differences in the methods of analysis of these variances, particularly as they relate to overhead expense. The first broad breakdown of overhead variances is between what is variously referred to as Idle Time variance or Volume Variance on one hand, and Controllable Variance on the other. In many cases this volume variance is the difference between the budgeted amount of overhead, which is based upon standard cost for a fixed volume of production, and the amount of overhead costs priced into production at standard costs. There are other cases in which the fixed overhead expenses are segregated into one group and the fluctuating overhead expenses into another. It is presumed that the fixed expenses remain fixed, regardless of the volume of production, and the fluctuating expenses vary more or less with production. In these cases the volume variance is the under-absorption of fixed expenses when the plant is working at less than normal or standard.

The plan, which is rather widely used, of separating the overhead expenses into two groups, fixed and variable, greatly simplifies

the problem of the analysis of overhead variances. However, inasmuch as it is not possible to compress overhead expenses into two such water-tight compartments as this, the resulting analysis of variances based upon this faulty assumption leaves much to be desired, to say the least. Before the introduction of machinery into manufacturing the element of overhead expense was negligible. With each addition of machinery there occurs an addition of overhead and a diminution of direct labor. During the last century the growth in this direction has been enormous. The proper accounting for the disposition of overhead expense then becomes a problem of increasing importance calling for greater refinement in the principles of its accounting. Some accountants set up a third group of overhead expenses which they call semi-variable. These expenses, as the name suggests, are neither fixed nor variable with production but lie between the two extremes. A study of expense variations indicates that even this classification is highly artificial.

It may be that there are some overhead items which do vary closely with the volume of production and some may be fixed or nearly so. Virtually all overhead expenses are subject to variation within more or less limited degrees, depending upon the volume of production. For example, the expense of the accounting department would be regarded by many as fixed. There is clearly enough evidence at hand at the present time to convince one that during a period of depression, as production falls off, help in this department is laid off in large measure and salaries are reduced. The same can be said of any other class of expense with little exception. The present case may be without parallel but the fact remains that during periods of less violent recession some change in the volume of these fixed expenses can be anticipated. Taxes are said to be fixed but experience has shown that taxes increase during a period of recession. Neither can it be said that variable expenses vary actually with production. They vary by differing degrees with production. It may be said that these expenses vary all the way from fluctuations in production to being virtually fixed. There is no clear line of demarcation or natural grouping into which they fall. Any grouping must be largely arbitrary. If it be understood that the variance accounts should reflect variations between actual costs and what the costs should be, every effort

should be made within the bounds of practical consideration to make these measures as accurate as possible. This kind of a grouping introduces another element of artificiality into the analysis of variances.

It is believed by the writer that the calculation of the volume variance under any of these methods described is incorrect in that the variance is the difference between the standard cost of overhead for normal capacity and the amount priced into production regardless of the volume of goods passing through the plant at that particular time.

A more nearly correct volume variance can be worked out through the use of a variable budget based upon that amount which would be considered a normal expenditure for different degrees of plant activity. One would find the cost of operating each department then work out an overhead rate for each department, which would be a cost per hour for the use of the facilities of that department. This is the normal rate and would be used for all *costing* purposes. For the purpose of *control* of overhead however, the supervisor under whose jurisdiction each expense item falls is made responsible and his expenditure is checked against the variable budget for such items depending upon the volume of production.

In order that the distinction between a volume variance under a variable budget plan and those previously described may be made clearer it is proposed to describe enough of the essential points to show how this variable budget is planned and operated.[5]

For example, let us consider a manufacturing department. It might be any productive department. The first step would be to charge against the department only those overhead items which could be definitely charged to the department. In other words, there would be for the present no allocation of superintendence or service department expenses.

Such items as the cost of the foremen for the department and the assistant foremen, miscellaneous wages for indirect labor which can be definitely charged against the department on a basis

[5] For a more complete treatment the reader is referred to, Cost Accounting, by Charles Reitell, International Text Book Company, Scranton, Pa., 1933, pp. 370 et sequor. Or by the same author, The Standard Cost plan for the NACA Company, N. A. C. A. Year book, 1931, pp. 14-33.

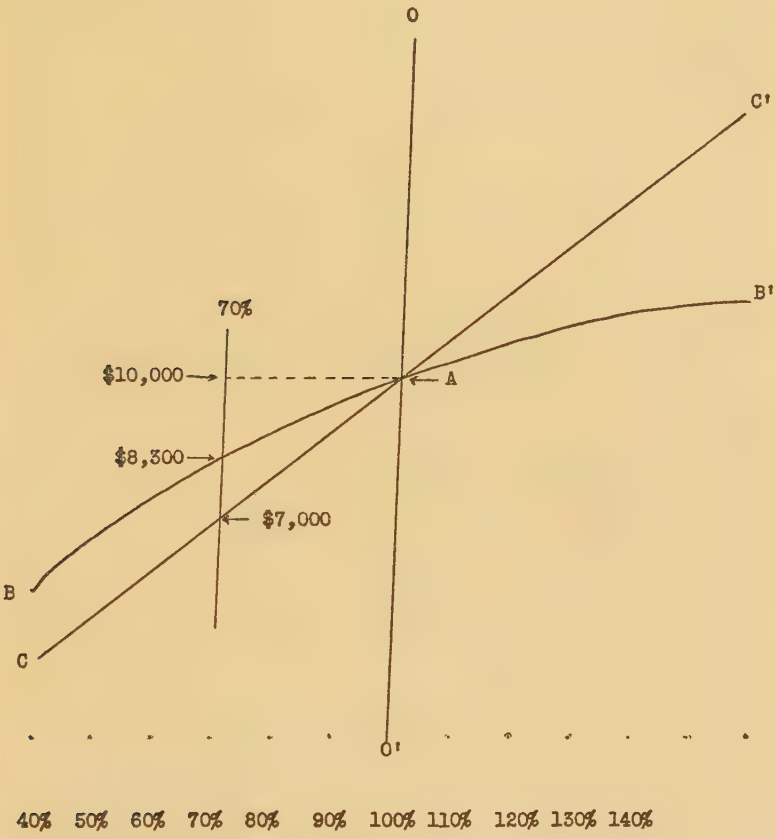
of actual time spent in the department, the cost of inspectors and helpers, the cost of repairs, defective work, material handling for the department, the cost of supplies and overtime bonus could be charged definitely to the department and the problem of allocation of expenses on an arbitrary basis would not yet appear. These and any other items which could be directly charged to the department would be so charged. The next step would be to prepare a table in which these items of expense appear vertically on the left-hand side of the table. Horizontally across the top of the page are entered at the head of successive columns the various per cents of capacity. Starting, for example with 40%, the second column should be headed 50% and the successive columns headed with a percentage figure increasing at 10% intervals for each column until 140% is reached. With a table set up in this way the next step would be to insert in the column headed 100% the normal expense for the department. Normal expense in this case is based upon what the officers of the company, together with the foreman, feel the overhead expense would be if the plant were working at a rate that would supply the sales department with all of the product that it could dispose of at current prices, eliminating seasonal variations. It might be better stated that it is an arbitrary base representing the physical output of the plant under average conditions. Let it be said that this base is 100,000 units per year. If the plant were to turn out 100,000 units of product per year each department could determine just how active it would have to be to produce that output. Department A, for example, at that activity would need the services of a foreman which we will say costs $300 per month. It would need two assistant foremen at say $35 per week, and so on down the line of other expense.

Having established the normal—the 100% column—the 90% column is worked out on the basis of the expenses incurred if the plant were working at 90% of the normal and so on with the rest of the columns. The combined opinions of the foremen, and superintendent and accounting officers should enable them to determine at what point they could lay off an assistant foreman or perhaps put him on day work. They could tell at what point they could lay off an inspector, etc. The cost of maintenance and supplies would run quite close to the per cent of operations. For example, it would be expected that when running at 90% of capacity

the cost of supplies would be 90% of the normal. The columns from 100% on up to 140% would be calculated in a similar manner. One would have to be skilled in the practical operating conditions of the plant in order to be able to set these figures satisfactorily. So far as the general overhead expense is concerned a variable budget could also be worked up for this class of expense. This group of expenses would be under the responsibility of the superintendent and not the foreman of a department. For cost purposes, however, these general expenses are allocated to the departments of a plant on some arbitrary basis but any variations do not figure on the responsibility of the foreman for the department.

It might be found, if the plant or department in question were sufficiently large, that instead of a tabular chart showing the variable budgeted expenses for a department, the variations may be sufficiently regular to enable one to fit them to a plotted parabolic curve on a cross section chart. One could then work from this curve. The writer has seen such a plan in use in several instances and it appears to be satisfactory and practical. In the case of a small department the variations for differing degrees of activity would be quite irregular if plotted on a curve. In a large department they tend to smooth out due to the larger number of items to be considered.

On Figure 1 the line B-B′ represents this curve of variable expenses, plotted to show the estimated overhead cost for varying degrees of activity. In this case, the volume variance is the difference between the actual production priced at standard rates and the budgeted overhead for the volume of business going through the plant at that particular time. This volume variance is to be distinguished from those set-ups discussed earlier; for example, in one case the cost of idle facilities is the difference between the budgeted overhead—a fixed figure regardless of the volume of production—and the actual production priced at standard rates. In either case, if the plant activity is less than normal a debit volume variance appears, and if plant activity is greater than normal a credit volume variance appears. The difference is one of amount. It is evident that the recorded cost of the volume variance would be less under the variable budget plan because the budgeted overhead expense is substantially lessened as production falls off, while



Point A	Standard Burden cost based upon Normal Capacity—$10,000.00
Line B-B'	Variable Budget Curve.
Line C-C'	Amount Costed into Production (A fixed rate)
Line O-O'	Line representing Normal Capacity. (100%)

Figure 1.

in other cases it remains fixed. This raises the question as to which of the plans more nearly reflects the correct circumstances of the case. It is the writer's opinion that the variable budget plan is the better. An illustration will help to make this point clearer.

We may assume a department to be working at 70% of capacity, when the overhead cost would be $10,000 if the department were working at 100% capacity. In this case only $7,000 would be costed into production and in many systems of standard costs the cost of idle facilities would be said to be $3,000. It must be understood that $7,000 does not represent the actual cost of overhead but that amount which is costed into production at standard rates. In the plan under consideration, reference would be made to the chart showing the budgeted overhead for output at 70% of normal, and it would be assumed that while the budgeted overhead for normal capacity is $10,000 the budgeted overhead for 70% capacity is only $8,300. Hence under this plan the cost of idle facilities is only $1,300. This is the more reasonable, for if the other $1,700 should not have been spent because it was deemed to be unnecessary when the plant was working at that capacity, why should it be called a non-controllable variance or the cost of idle facilities? It is a controllable variance and should be regarded as such if any of that amount should have been spent or charged.

The Disposal of Variances Through Application to Product Costs

The disposition of variances is handled in several different ways. The variances may be closed out into operating costs for the period, they may be carried as reserves, or they may be broken down and portions of the balances handled in different manners.

In the first place there is a substantial group of cost accountants who feel that the so-called actual costs should not be disturbed and that the operating results should reflect these costs. The principles of standard costs relating to the analysis of variances can be applied with the result that actual costs will be reflected in the statements by providing the work-in-process accounts with double sets of columns on the debit and credit sides. One column on each side shows actual costs and the other, the standard costs.

A typical illustration would be to charge material, for example, to work in process at both standard and actual costs with an offsetting credit to raw material at actual cost, the data being obtained

from perpetual inventory records. The standard cost is the standard quantities times the standard price and the actual cost the actual quantities times the actual price. When the goods pass on into finished goods the work-in-process accounts are credited at actual and standard for the goods completed, and finished goods accounts are charged at actual cost. The variance then can be broken down into price and usage elements by calculating the material used at standard cost. In case further refinement of variance analysis is necessary it can be made at this point. The other elements of cost can be handled in a similar manner. This plan presupposes a suitable breaking up of the goods-in-process accounts.

The essential point in question is whether actual or standard costs should be considered the real costs. This depends upon one's conception of standard costs. The writer's views on this point have already been given. Those who are reluctant to accept standard costs as costs feel that they have gained the advantages to be derived from a standard cost system through analysis of variances without interfering with what they believe to be real costs. If on the other hand one is to accept the principle of standard costs as a system of more scientific cost determination, as has been previously described, there is no point to carrying finished goods at any figure other than standard.

In most cases the differences between actual and standard costs are diverted into variance accounts with appropriately labeled titles. Once these variances are accumulated in a separate set of accounts they are subject to a variety of treatments. A very common plan consists in accumulating the variances in the variance accounts for the purpose of analysis and then at the end of the accounting period closing the balances of these accounts into cost of goods sold for the period. The variances are thus disposed of in such a way that the profit and loss statement reflects approximately the same results for the accounting period as if actual costs were used throughout. So far as the goods sold are concerned the results would be the same as if actual costs were used. Those variances, however, which apply to inventory on hand at the end of the fiscal period have been closed out. The carrying of the inventory at standard figures, the difference between actual and standard, whatever this may be, having been closed into cost of goods sold, influences the profits for the period to that amount. If costs were

high and there were a debit variance balance the operating profits would be less for the period by the amount of this inventory variance. If the costs were low and there existed a credit variance the result would be greater operating profits than would be the case if actual costs were used. Those who feel that actual costs should be shown would criticize this plan by saying that earnings were being anticipated. This criticism would hold only if it were to be admitted that actual costs were real costs. Many would not make this admission.

If it be desired that the operating profit for the period reflect the same figures as those resulting from the use of actual costs, the variance accounts could be broken up into two parts. That part of the net variance applicable to the goods which were sold might be applied to cost of goods sold, and that part of the variance applicable to inventory on hand might be set up as a reserve against the inventory.

In those cases in which it is anticipated that the results for the fiscal period should be based upon standard costs, it is logical that the variances should be looked upon as balance sheet items rather than as profit and loss statement items. The attitude is that these variances constitute balance sheet reserves. If one's conception of standard costs is such as has been explained, viz., that the standard costs are based upon what the average costs would be over a period of a business cycle with the plant operating under efficient conditions, it would be logical to carry the variances as reserves on the balance sheet. For example, during a period of high production a credit variance would be created. This should not be closed into income but should be carried as a reserve on the balance sheet into which losses would be closed at a time when production was below normal. If the standards have been properly set over a period of a business cycle the credit balance would be absorbed. It is realized that this is a somewhat theoretical attitude which could only be approximated in practice. Thus, in an effort to be conservative there are those who would take a credit variance, if one existed as a balance sheet reserve, and close into it subsequent debit variances. If the debit variance were greater than the credit variance the balance would be cleared out into profit and loss. If there were no credit variance but only a debit variance it would also be closed into profit and loss.

A common practice in the disposition of variances is to close them out into cost of goods sold or profit and loss regardless of the nature of the variance. The operating profit should, in so far as possible, reflect the results of the efforts of management. It is logical therefore that, inasmuch as the variances have been broken down as to cause, those variances which are due to conditions over which management has no control should receive different treatment on the statements from those variances which are under the control of management. This is particularly true if these variances are significant in amount. These variances beyond the control of management are made up for the most part of price level variances and the cost of idle time. So far as overhead expense goes, the factor of idle time is often very important. It often constitutes a substantial part of the overhead variance. Idle time may be due to a number of causes. It is important for the purpose of management to know these causes. In some cases idle time is always considered a volume variance with the idea that it is not controllable by the plant management. This is not necessarily true however, because idle time in a plant may be due to improper routing of products so as to produce a bottle neck effect at certain points, causing some departments to remain idle. Departments may also be idle because of a temporary shut-down of power. Idle time in a given department may be due to other causes of similar nature and clearly chargeable against the factory management. There may be idle time in a given department due to the fact that the administration of the enterprise, in building up the facilities of a department, builds for a capacity in excess of present requirements with a view to future expansion. Idle time of these facilities is not a responsibility of the factory management but is the responsibility of the administrative department. Idle time also may be due to the fact that economic conditions are such that merchandise cannot be sold, as would be experienced during a period of business depression. This clearly is a cause beyond the control of the enterprise in question. Some of these non-operating idle time variances mentioned would be automatically eliminated in the setting of standards.

Inasmuch as the operating profit of a fiscal year should show the results of the efforts of management, these variances should properly be segregated into those chargeable to the responsibility of management and those beyond the control of management.

Those variances which are controllable could properly be taken into consideration as a part of the cost of goods sold, and those which are beyond the control of management should be shown as a non-operating profit or loss item as the case might be.

So far as the effect of these plans upon inventory valuation on the balance sheet is concerned, it is not of great consequence in standard cost practice, because the auditors work out, as a matter of policy, a valuation of inventory independently in order to give effect to current prices.

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